

ROOM ACOUSTICS

“We would never teach reading in a classroom without lights. Why then do we teach in “acoustical darkness?” Speaking to a class, especially of younger children, in a room with poor acoustics, is akin to “turning the lights out” (Erdreich, 1999)

Room Acoustics: the qualities that determine the ability of a room to reflect sound waves in such a way as to produce distinct hearing

HOME

- **Poor acoustics affect speech perception and incidental learning**
- **Keep television and music off unless that is the focus of the activity**
- **Become aware of noise from air conditioner, dishwasher, fans**

If parents want their child to learn to use their hearing, it's important to develop a good listening environment. For starters, let's make sure that background noise is kept at a minimum, with radios, televisions, and cd players turned off, unless that is the focus of the activity. Noise from air conditioners, humidifiers, heating units, fans, dishwashers, etc. should be pointed out to parents. Rooms without carpeting and any hard, shiny surfaces can be thought of as making sounds reverberate, and therefore, more difficult to identify. If possible, use a stethoscope with the child's hearing aid to let others in the environment hear how each background sound is amplified by the hearing aids. Even when parents are not interacting directly with the child, she can benefit more from incidental learning such as overheard conversations in a more quiet environment

CLASSROOM

- **Poor acoustics affect academic success and behavior in varied populations**

In the classroom, certain acoustic conditions are necessary for comfortable and effective listening. Excessive classroom noise and/or reverberation can be detrimental to all academic areas, including speech perception, language development, reading/spelling ability, behavior, attention, on-task behaviors, and concentration, as well as the vocal health and overall effectiveness of teachers. Children who are at risk for education problems due to poor classroom acoustics include those experiencing temporary hearing loss due to ear infections. This may include as much as 15% of the school age population at any time, according to a recent analysis done by the Center for Disease Control. Of course, children with mild to moderate permanent hearing losses are affected, as well as those with learning disabilities, Attention Deficit Disorder, and children for whom English is a second language. It's interesting to note that research indicates that high levels of background noise in classrooms compromise speech intelligibility to such an extent for many young children that their reading, communication, and learning

skills may not be developing adequately. Because children from preschool to 10 years old are neurologically immature and lack the experience necessary to predict from context, they are inefficient listeners who require optimal conditions to hear and understand. Several European countries have already adopted acoustical standards for school design and construction.

- **External noise (outside building; traffic, playgrounds, airplanes, mowers, construction)**
 - Locate classrooms for deaf/hard of hearing away from external noise sources
 - Utilize landscape strategies (shrubs, trees, walls)
- **Internal noise (within building, outside room; cafeteria, music room, gym, busy hallways)**
 - Locate classroom in quiet area of building
 - Double, or thick wall construction
 - Acoustical ceiling tile and/or carpeting
 - Acoustically treated or well-fitting high-mass-per-unit doors
 - Heating or cooling ducts lined with acoustical materials or baffles
- **Room noise (inside classroom; talking, shoes on floor, moving chairs/tables, heating/AC units)**
 - Replace malfunctioning heating/AC units
 - Lubricate fans and electrical motors
 - Install thick, wall-to-wall carpeting with adequate padding
 - Place acoustical paneling (or cork board) on walls and ceiling
 - Put rubber tips on legs of desks and chairs if room isn't carpeted (tennis balls)
 - Hang thick curtains or acoustically treated Venetian blinds over window areas
 - Avoid open-plan classrooms
 - Replace fluorescent lighting systems regularly
 - Encourage children to wear soft-soled shoes